Executive Summary

Purpose

In May 1999, the Office of Policy, U.S. Department of Energy (DOE), asked the Energy Information Administration (EIA) to prepare an update of EIA's 1992 Service Report on Federal energy subsidies,[1] using a more specific definition of "subsidies" provided by the Office of Policy. In its letter of request, the Office of Policy asked the EIA to examine Federal programs that provided a "specific financial benefit" covering "primary energy only."[2]

Federal energy subsidies take three principal forms:

- **Direct Payments to Producers or Consumers.** These are Federal programs that directly affect the energy industry and for which the Federal Government provides a direct financial benefit. Currently, three energy programs provide direct payments to producers or consumers. Two of them focus on energy end use, and are excluded from this study. The third program is the Renewable Energy Production Incentive.

- **Tax Expenditures.** Tax expenditures are provisions in the tax code that reduce the tax liability of firms or individuals who take specified actions that affect energy production, consumption, or conservation in ways deemed to be in the public interest.

- **Research and Development.** R&D expenditures do not directly affect current energy production and prices, but if successful they could affect future production and prices. An example of the impact of Federal energy R&D is the important role that Federal R&D spending has had in the development of the U.S. commercial nuclear power industry.

In addition to the principal types of programs described above, there are Federal programs that may act as subsidies but for which the existence or impact of the subsidy is uncertain. These programs are represented by the excess liabilities of trust funds, such as the Black Lung Disability Fund. Although trust funds are discussed in this report, no specific estimate of their subsidy element is presented because of the difficulty of estimating the potential future liability to the Federal Government.

The size, scope, and market effects of energy subsidies depend primarily on the definitions and methods used to measure their impacts.[3] In economics, the term "subsidy" is used to define a specific program in which the Government makes direct payments to producers or consumers to defray a portion of the cost of producing or consuming some product. The application of this definition to real-world programs, however, can be much more complex.

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[1]Energy Information Administration, *Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets*, SR/EMEU/92-02 (Washington, DC, November 1992).

[2]The Office of Policy has indicated that it intends to request a second study that will cover energy end use and electricity.

[3]Appendix A reviews various energy subsidy reports.

This report measures subsidies based on the cost of the programs to the Federal budget. This approach has the advantage of being relatively easy to measure using available information. However, Federal budget estimates generally overstate both the economic costs and the market impacts of specific programs. Programs that offer small subsidies for products for which there are huge existing markets tend to function mostly as transfer programs; that is, their market impacts are negligible, and for the most part they simply redistribute funds from one part of the economy to another, with the Government acting as the intermediary. More often, Federal energy subsidies offer relatively large payments to producers using specific energy technologies that otherwise would be uneconomical. In these cases, the effects on the larger markets are small, but the impacts on the use of particular technologies may be significant. Finally, while subsidy programs are legislated because they are presumed to produce some social benefit that exceeds the expected cost of the program, no attempt is made in this report to measure the social benefits that may accrue from the programs reviewed.

Federal Government intervention in energy industries has generally declined over the past two decades. Price controls for domestic oil and natural gas production were largely eliminated by the mid-1980s. The Tax Reform Act of 1986 reduced or eliminated many tax expenditures, several of which figured prominently in earlier studies. The Energy Policy Act of 1992 (EPACT), while introducing incentives for renewable energy and alternative transportation fuels, set the stage for the eventual privatization of DOE's uranium enrichment activities. The implications of the EPACT provisions were not incorporated in EIA's 1992 subsidy report, because their date of enactment followed that analysis.

Summary of Results

Federal subsidies for primary energy are estimated to be $4.0 billion in fiscal year 1999, down about $1 billion (1999 dollars) from fiscal year 1992 (Table ES1 and Figure ES1). Direct expenditures from the Renewable Energy Production Incentive are estimated to be $4 million in fiscal year 1999, as compared with direct expenditures of $82 million (1999 dollars) for synthetic fuel in the 1992 report. Tax expenditures related to primary energy total $1.7 billion (1999 dollars), with another $0.7 billion for the ethanol exemption from Federal excise taxes. EIA's 1992 report showed greater tax expenditures ($2.2 billion in 1999 dollars) but lower Federal excise taxes ($0.5 billion). In 1999, the two largest items are the alternative fuels production tax credit, largely used to develop coalbed methane and tight sands ($1.0 billion), and the percentage depletion allowance for the oil, gas, and coal industries. Tax deferrals on enhanced oil recovery are the third largest expenditure.

Federal R&D appropriations related to energy markets (excluding basic research) are estimated at a total of about $1.6 billion in fiscal year 1999–down from $2.0 billion in 1992 (in 1999 dollars). Federal spending on coal and nuclear power research has declined substantially since 1992. The decrease in nuclear energy R&D expenditures has resulted largely from declines in spending directed at treatment and storage of nuclear waste and the decommissioning of obsolete nuclear power plants. The fiscal year 1999 budget includes about $0.6 billion for "nuclear" R&D, most of which is related to nuclear waste disposal and cleanup of nuclear research facilities. Less than $0.1 billion is budgeted for research on new nuclear plants. Coal R&D expenditures have also declined, as a result of cuts in spending on clean coal technologies.

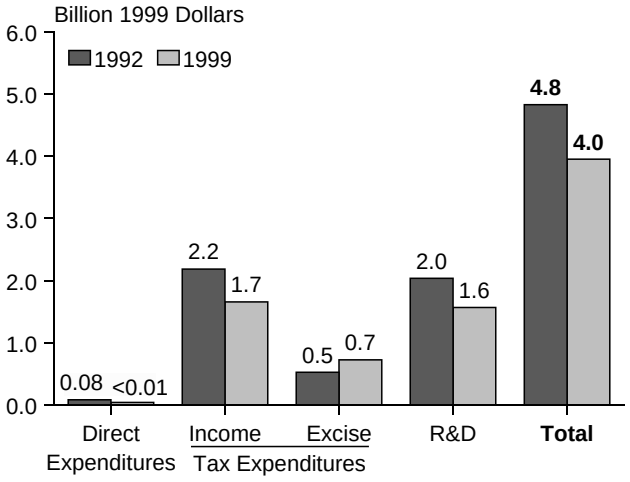
Table ES1. Summary of Primary Energy Subsidy Elements in Federal Programs by Fuel and Program Type on a Budget Outlay Basis, Fiscal Year 1999
(Million 1999 Dollars)

Fuel	Type of Subsidy				Total
	Direct Expenditures	Tax Expenditures		Research and Development	
		Income	Excise		
Oil	0	263	0	49	**312**
Gas	0	1,048	0	115	**1,163**
Coal	0	85	0	404	**489**
Oil, Gas, and Coal Combined[a]	0	205	0	0	**205**
Nuclear	0	0	0	640	**640**
Renewables	4	15	[b]725	327	**1,071**
Electricity	0	40	0	[c]33	**73**
Total	**4**	**1,656**	**725**	**1,567**	**3,953**

[a]The category Oil, Gas, and Coal Combined includes expenditures that were not allocated to any one of the three individual fuels.
[b]Alcohol fuels excise tax.
[c]Electricity research and development is advanced turbine technology. Other generation technology research and development is distributed by fuel.
Sources: Most information drawn from Office of Management and Budget, *Budget of the United States Government, Fiscal Year 2000* (Washington, DC, February 1999).

The total value of Federal subsidies to oil, natural gas, coal, and nuclear power is estimated to be $2.8 billion in 1999 (Table ES1), compared with wholesale spending of $127 billion (1999 dollars)[4] in 1998 for purchases of those fuels and total retail expenditures of $363 billion (1999 dollars) in 1995.[5] Although the value of energy subsidies is low relative to total energy expenditures, some forms of energy receive subsidies that are substantial relative to the value of the fuels. Of the primary fossil fuels, natural gas benefits the most from Federal subsidies in 1999–a total of $1.2 billion, almost all of which comes from a tax credit on the production of alternative fuels, primarily gas from coalbed methane and tight sands. Although no production data are available for natural gas from tight sands, coalbed methane accounted for 6 percent of all natural gas production in 1997. The $1.0 billion alternative fuel credit in 1999 can be compared with natural gas sales valued at $39 billion (1999 dollars) at the wholesale level in 1998 and $79 billion (1999 dollars) at the retail level in 1995. A subsidy amount of $4 billion or $5 billion is, in

Figure ES1. Summary of Primary Energy Subsidy Elements in Federal Programs by Program Type on a Budget Outlay Basis, 1992 and 1999



Source: Tables 1 and 2 in this report.

[4]Wholesale expenditures do not include nuclear fuel.
[5]The 1995 data on retail expenditures for energy are the latest available.

general, too small to have a significant effect on the overall level of energy prices and consumption in the United States; however, the subsidy programs described in this report are, in most cases, targeted at narrow segments of the energy industry (e.g., ethanol production for blending into gasoline and natural gas production from coalbed methane and tight sands).

Appendix A reviews different subsidy reports in the literature. A number of those reports have produced larger estimates of subsidies than this report due to the inclusion of regulation, defense, transportation, and/or tax expenditures that are not specific to energy.